UNITED STATES DISTRICT COURT
WESTERN DISTRICT OF NEW YORK

SAMUEL M. ROBERTS,

Plaintiff,

-vs-

LOS ALAMOS NATIONAL SECURITY, LLC, AWE, PLC, and MASSACHUSETTS INSTITUTE OF TECHNOLOGY,

Defendants,

11-cv-6206(L)

AWE, PLC,

Third-Party Plaintiff,

-vs-

UNIVERSITY OF ROCHESTER,

Third-Party Defendant.

REPLY DECLARATION OF CHRISTINE TRAMONTANO

Christine Tramontano, hereby declares, pursuant to 28 U.S.C. §1746, under penalty of perjury as follows:

1. I am an associate with the law firm of Holland & Knight LLP, attorneys for defendant/third-party plaintiff, AWE, plc, and am admitted to practice in the Western District of New York. I respectfully submit this Reply Declaration in further support of AWE's motion for summary judgment.

2. Attached hereto as Exhibit K is a true and correct copy of a document produced by the University of Rochester and Bates stamped UR 000933-958. This document has previously been before the Court in connection with the University of Rochester's motion for summary judgment attached as Exhibit 10 to the Declaration of Eric Ward.

Dated: December 5, 2012

/s/ Christine Tramontano
Christine Tramontano

EXHIBIT K

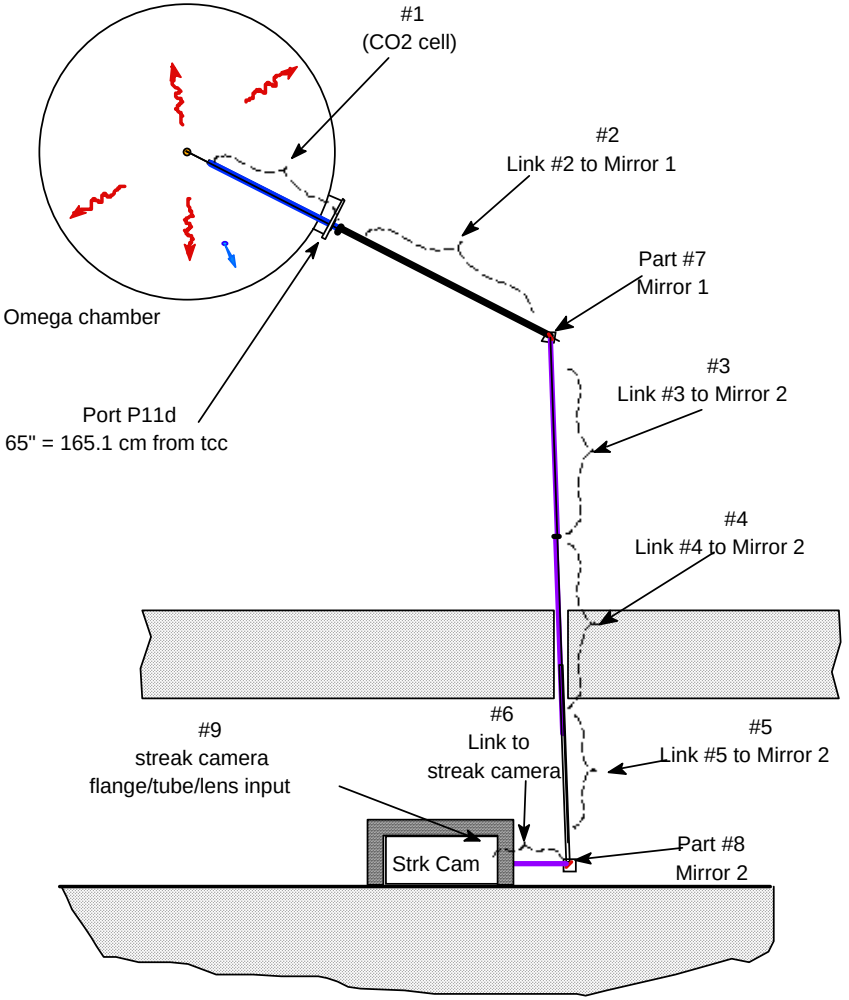
Conceptual Design Review 10/14/2005

Vladimir Glebov

High Yield Neutron Temporal Diagnostic (HYNTD) for OMEGA

OMEGA Light Pipe

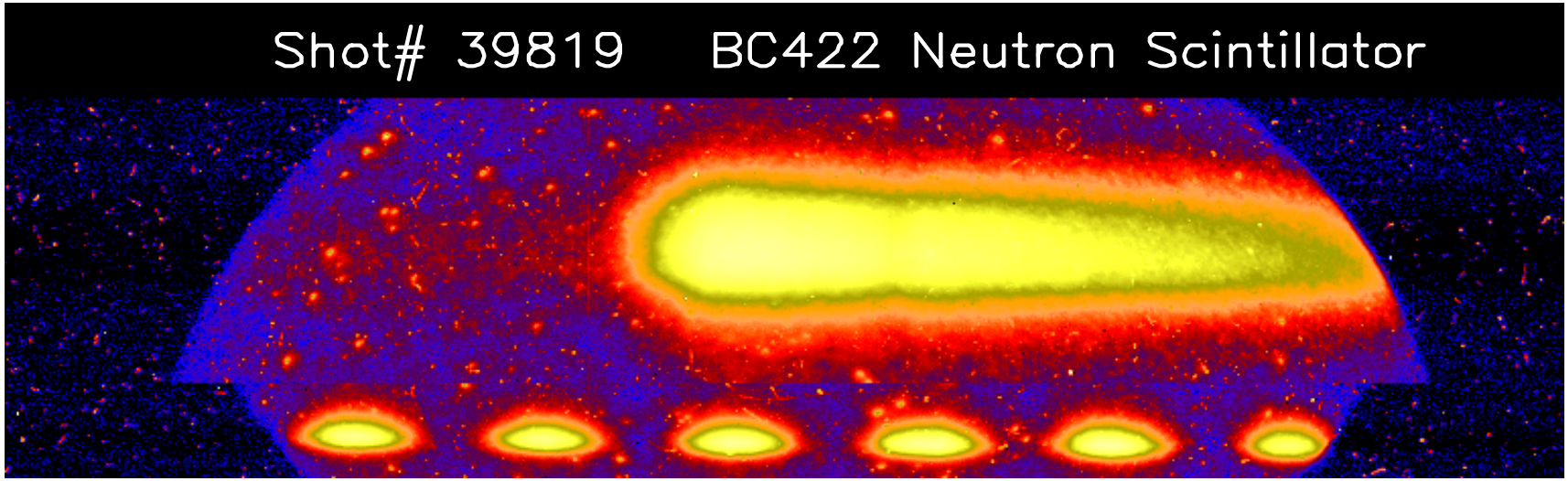
- Light pipe: target chamber to La Cave
  - 16 cm from TCC
  - Straight links, 2 mirrors
  - Laser pointer for alignment
  - To MCP or streak camera
- Three sources of signal:
  - Scintillator
  - Neutron Cherenkov (SF6 glass)
  - Threshold Cherenkov (CO_2)



Proof of principal of HYNTD was demonstrated in May 2005 during Light Pipe diagnostic test.

UR LLE

Shot # 39819, Yn = 3 x 10^{13}, 5 mm BC-422, 48 cm from TCC, ND=1



At 22 cm from TCC, 1 mm BC-422 HYNTD will be sensitive from 5 x 10^{12}
Upper limit: without shielding ~ 10^{14} , with proper shielding ~ 10^{15}

Time resolution: Light Pipe estimation 20 ps, not yet demonstrated.

We have learned some valuable lessons for the future HYNTD design from Light Pipe operations.

- **2” reentrant tube can interfere with beams offset from TCC.**

  Solution: two step reentrant tube with ~ 1” front end

- **100 ps x ray signal is not strong enough for timing calibration**

  Solution: make front end of the reentrant tube from Al

- **1” light pipe and support was not rigid enough**

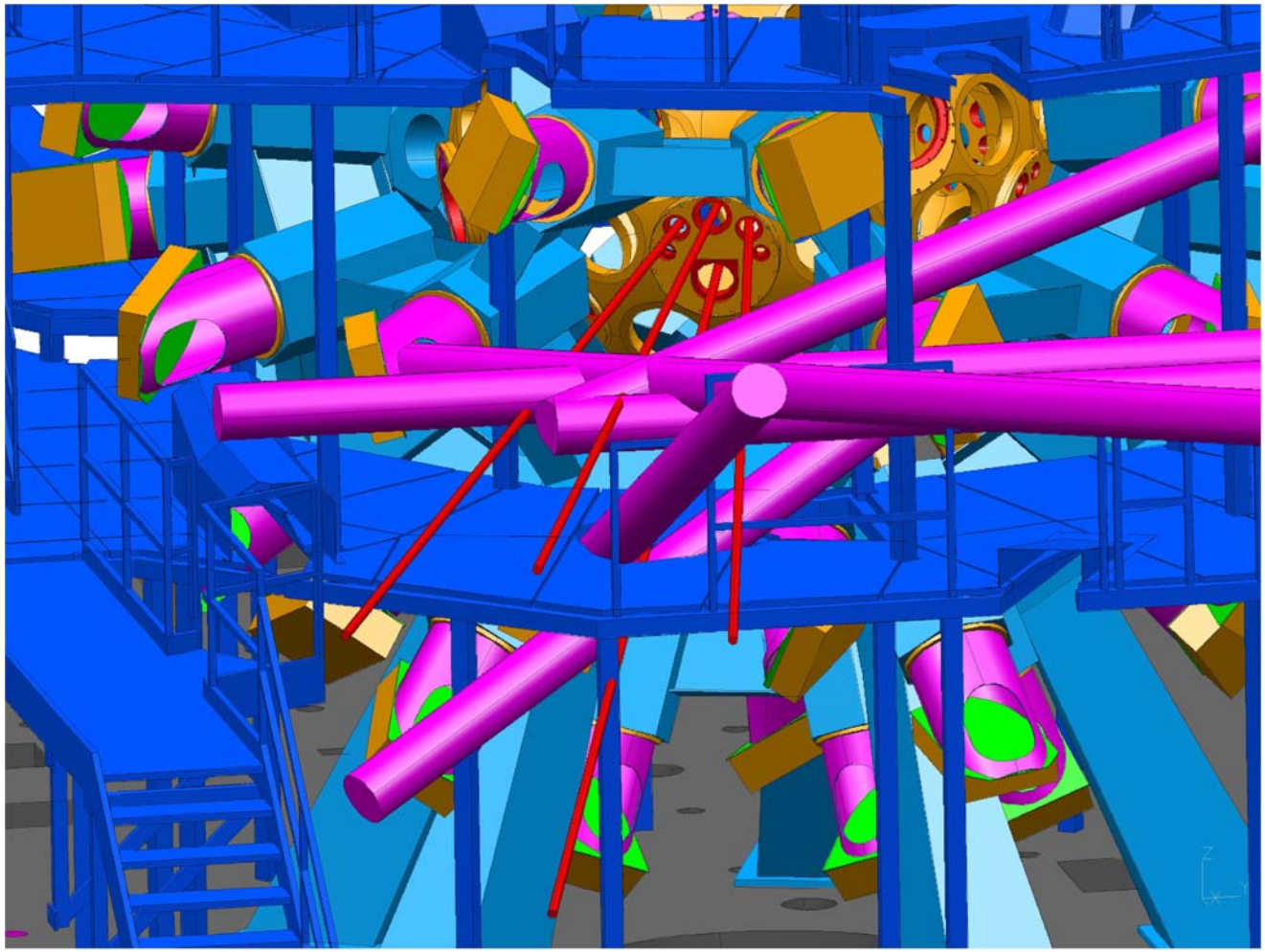
  Solution: switch to 2” light pipe, make more rigid support.

  2” pipe => less number of reflections, more space for optics

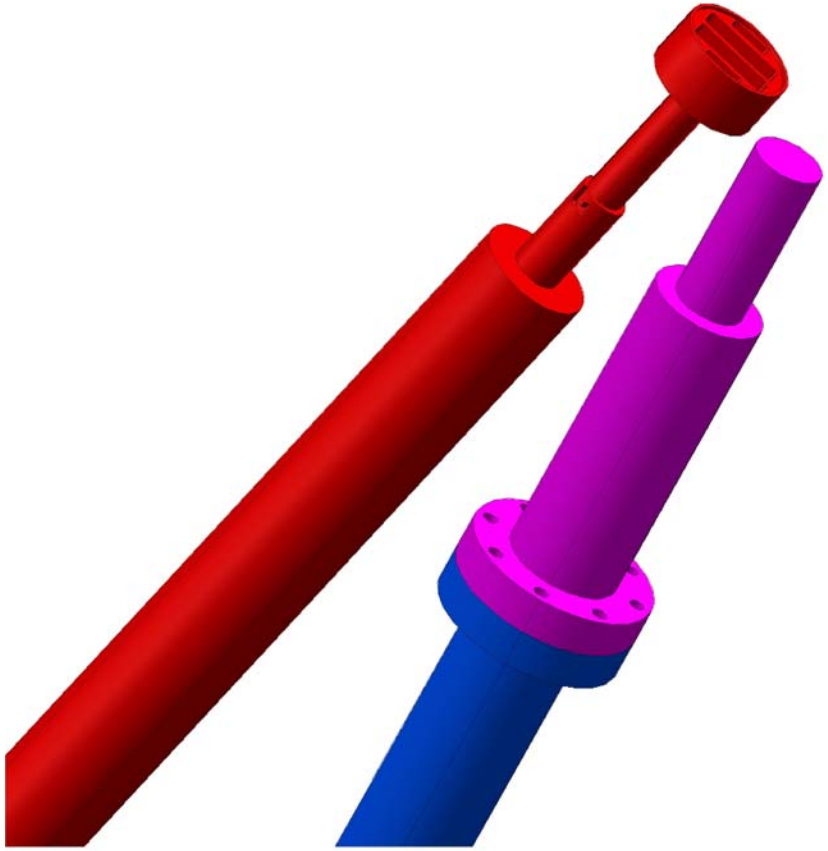
All 4”,6” and 8” sub-ports were analyzed as candidates for HYNTD, but only P11 looks like a reasonable candidate.

UR LLE

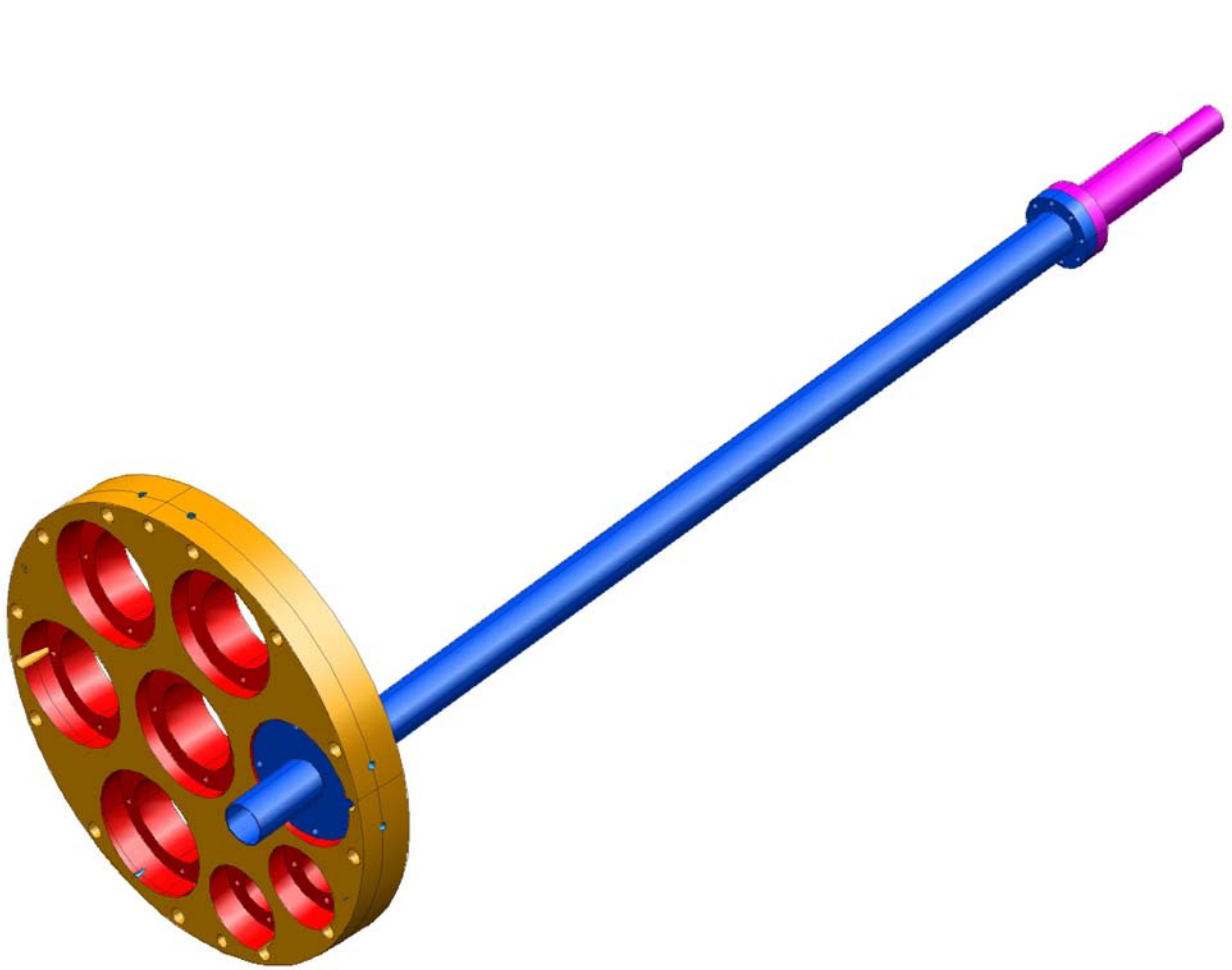
Sub-port H13



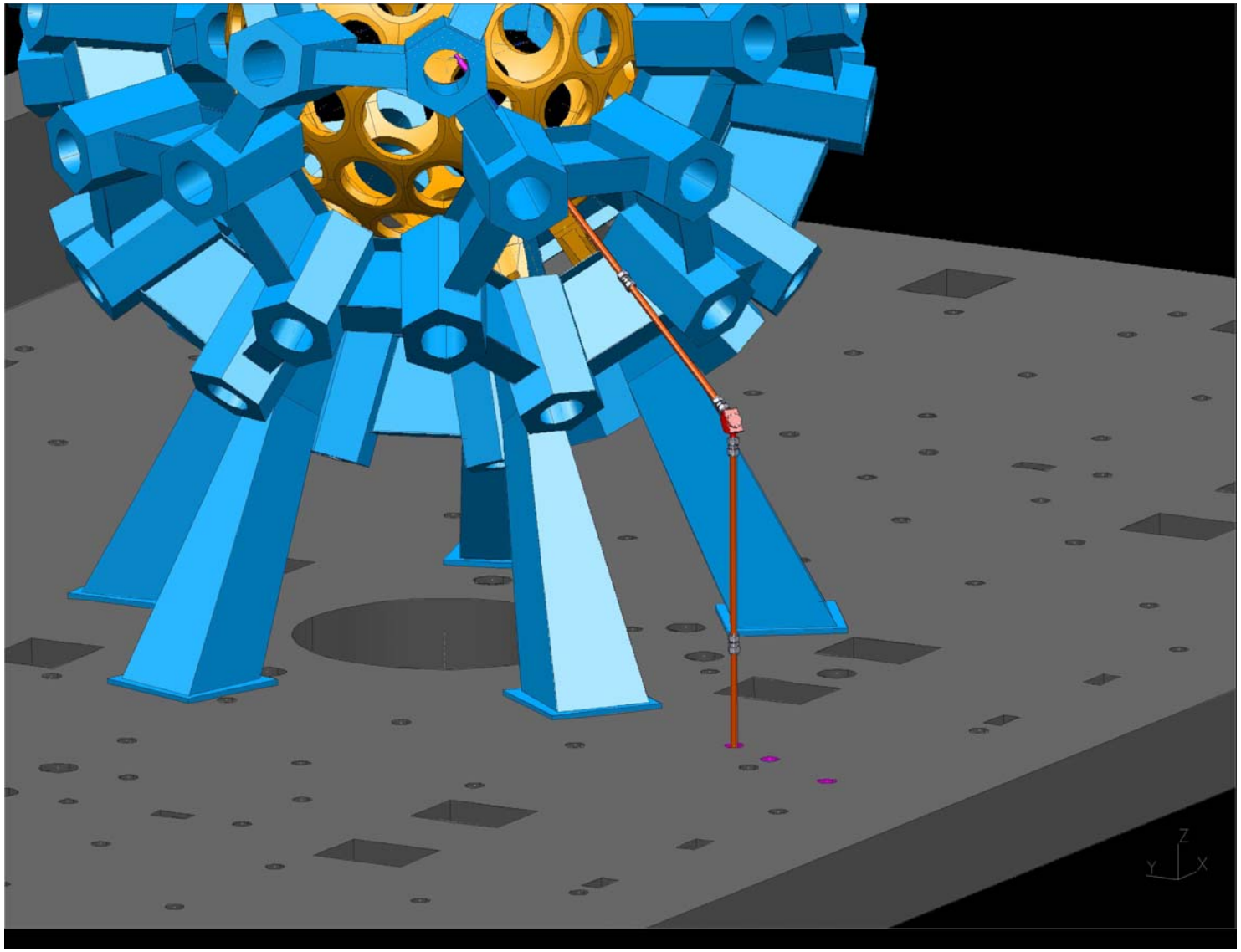
HYNTD in P11A will accommodate KO in P11D and PCD in P11H sub-ports.



A new reentrant tube for HYNTD will consists from ~2” stainless steel and ~1.25” aluminum parts.



HYNTD in P11A will require to drill a new hole in the floor of the Target Bay.



HYNTD will require space for ROSS and neutron shielding in La Cave. ROSS without calibration module.

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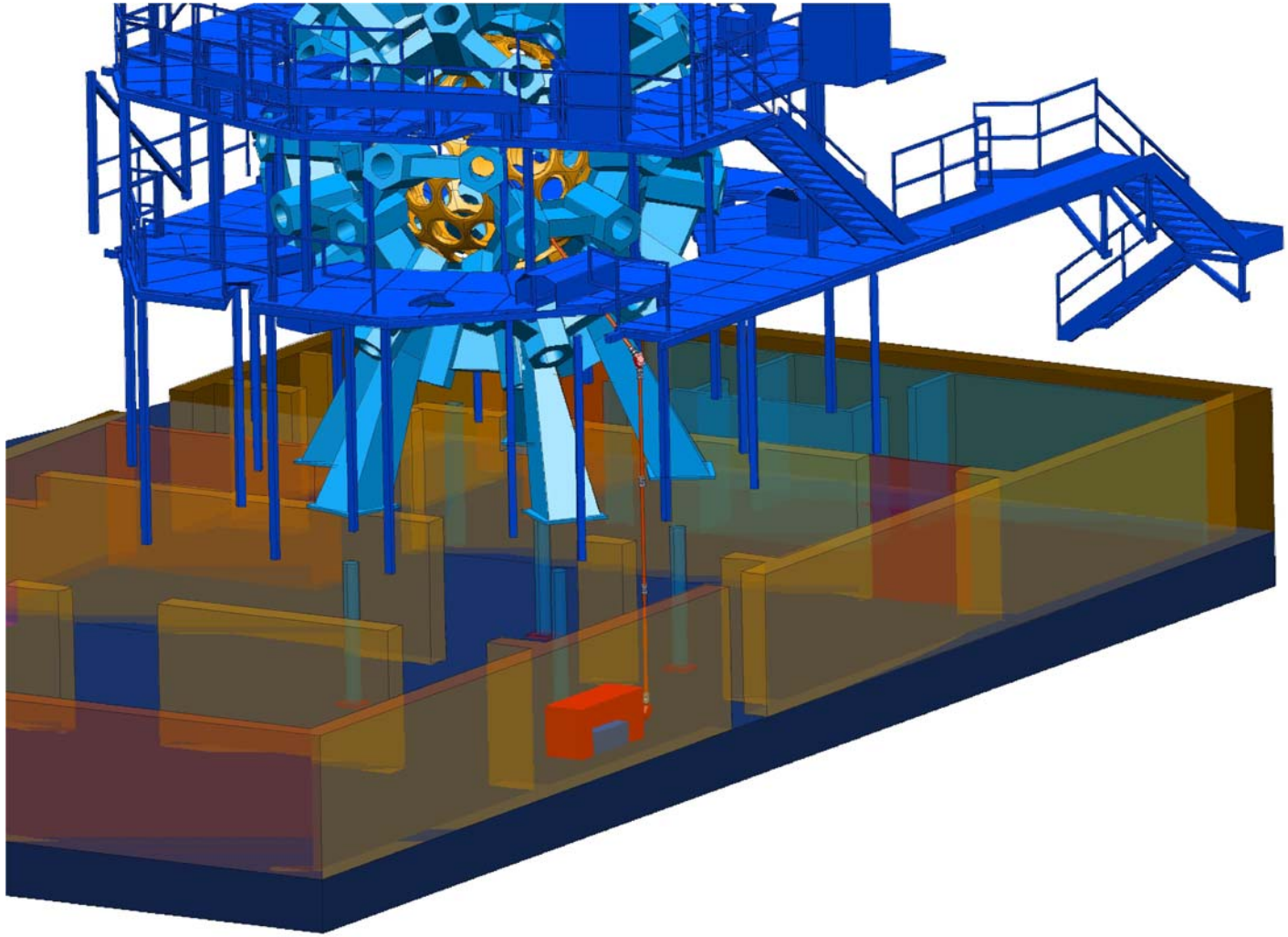

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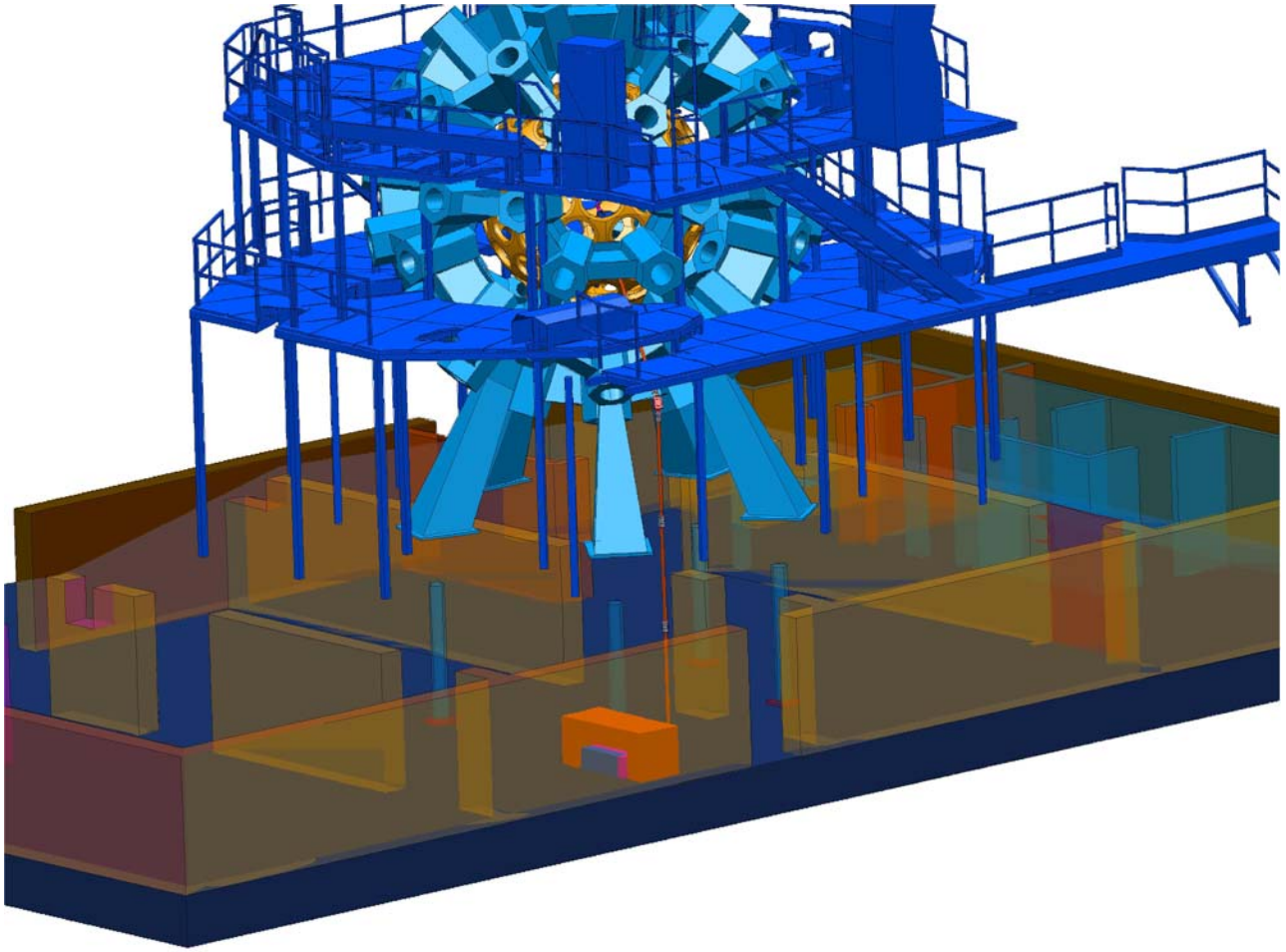
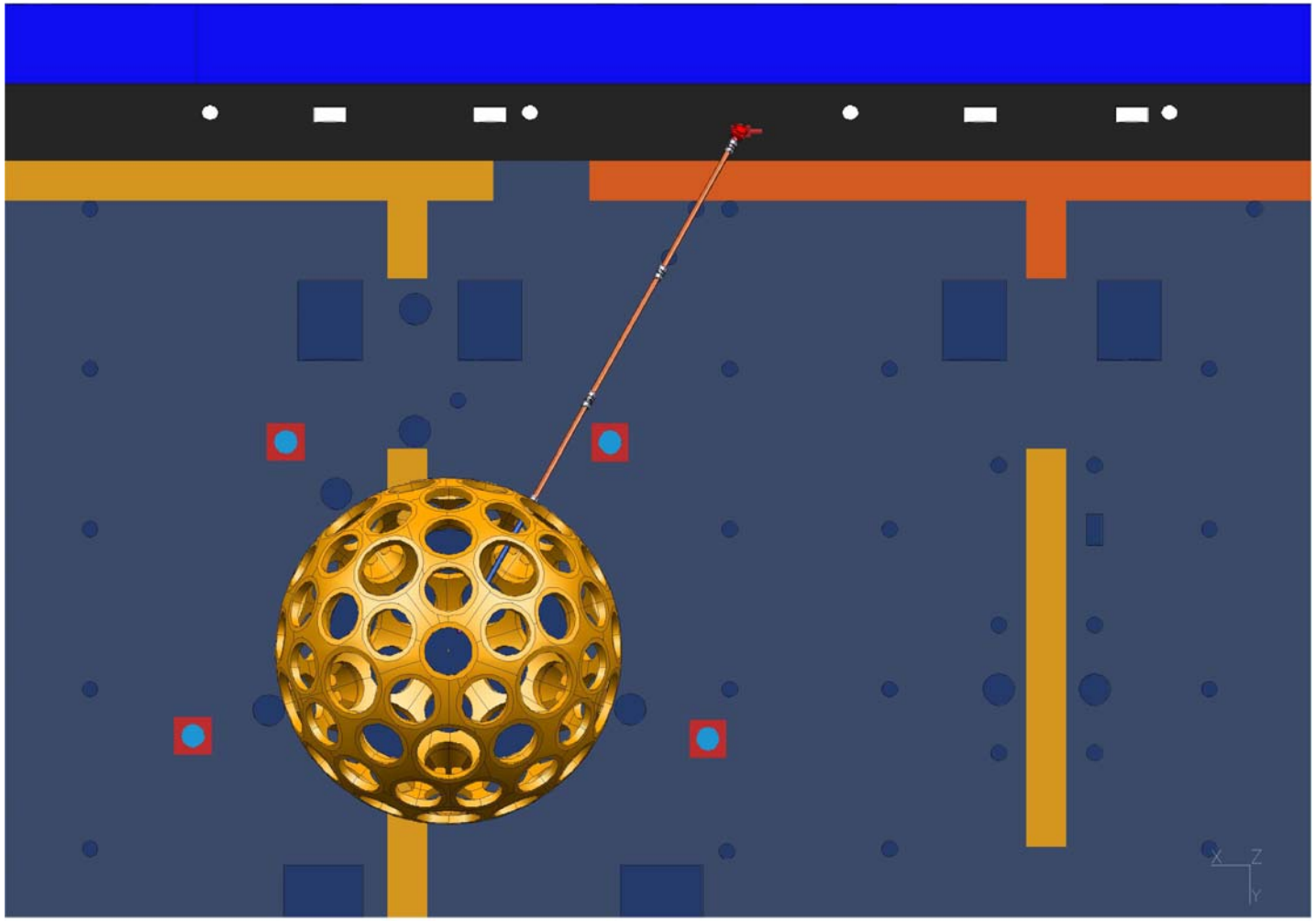


In case of very high background during fast ignition shots ROSS can be moved outside of La Cave.



HYNTD manufacturing and installation schedule is determined by KO schedule

UR LLE

• HYNTD Preliminary design review FDR for hole, tube, and platform	11-12/05
• Drill hole in the Target Bay and platform modification	12/05 – 01/06 m. weeks
• Reentrant tube manufacturing	12/05
• Pipes, support manufactures	12/05 – 01/06
• HYNTD Final design review	02/06
• Reentrant tube and KO installation	03/06 m. week
• HYNTD installation	04/06
• HYNTD operation	05/06

THE UNIVERSITY OF ROCHESTER

INTRAMURAL CORRESPONDENCE

Laboratory for Laser Energetics

DESIGN REVIEW MEMORANDUM **17 Oct 2005**

TO: All Attendees

COPIES: D. Meyerhofer, S. Loucks

FROM: V. Glebov

SUBJECT: **High Yield Neutron Temporal Diagnostic CDR – Oct 14, 2005**

Reference: Design review materials at: \\Hopi\Experimental\DiagnosticDevelopment\HYNTD

Attendees:

W. Armstrong	V. Glebov	J. Reid
A Dillenbeck	G Pien	T Sangster
C Fullone	S Roberts	C Stoeckl
T Duffy	K Thorp	T Wilson
R Keck	M Meleski	C Culligan
		J Soures

Vladimir Glebov presented the CDR for the High Yield Neutron Temporal Diagnostic for Omega. The existing OMEGA Neutron Temporal Diagnostic (NTD) streak camera located in the Target Bay is saturated by neutron-induced background at neutron yields higher than $3 \times 10^{13} – 5 \times 10^{13}$. Experiments with cryogenic DT target may exceed this yield limit. Fast Ignition experiments using both OMEGA and OMEGA-EP lasers can produce neutron yield up to 1×10^{15}. Therefore a new High Yield Neutron Temporal Diagnostic (HYNTD) is required for the future experiments on OMEGA. Recent tests on OMEGA demonstrated feasibility of a new NTD detector based on a light pipe. In this approach light from a scintillator in reentrant tube delivered to streak camera outside of the Target Bay area by a polished stainless pipe. The goal of this project is to build HYNTD based on a light pipe.

Vladimir Glebov presented result of light pipe tests that effected a HYNTD design. The project encompasses the deployment of a 2”/1.25” reentrant tube to a P11A sub-port and a 2” light pipe to a ROSS streak camera located in LaCave. Mechanical Group analysed all other sub-ports as possible HYNTD location and rejected all of them because of beam of equipment interfierence. The location of the HYNTD in the P11A sub-port will allow simultaneous operation of the HYNTD and KO2 in sub-port P11D as it was dicussed in OMEGA KO retractors FDR 09/14/2005. The proposed HYNTD design, manufacturing, and installation schedule maximize the use of KO2 for cryogenic experiments.

The following summarizes the discussions:

Discussion
A hole must be drilled in the floor of the target bay. This hole size and position must be finalized by the PDR.

The nose tip must be made out of aluminum; the steel tip attenuation is too high.

The P11 platform must be modified to accommodate HYNTD in P11A sub-port. The platfort modification must be finalized by the PDR.

The ROSS streak camera will be installed on the floor of LaCave. The floor is the best location for shielding and distance.

The light pipe turning mirrors and junctions will require rigid support. This needs to be designed for the FDR.

Controls and software requirements need to be defined by the PDR.

Action Items:

#	**Items**	**Responsibility**
1	Target Bay Hole Location	V. Glebov, ME, G. Pien
2	P11 platform modification	S. Roberts, ME, G. Pien
3	HYNTD design	V. Glebov, S. Roberts, ME
4	Controls and Software Requirements	V. Glebov and System Eng
5	Optical fiducial for HYNTD	V. Glebov